

CLAIMS

1. Process for manufacturing a mat whereby at least one first layer or series of layers of strand(s) formed of filaments and at least one second layer or series of layers of strand(s) formed of filaments are deposited on at least one moving conveyor, **characterized in that** at least some of the strand(s) of the first layer or series of layers are opened before the first layer or series of layers and the second layer or series of layers are superposed.
2. Process according to Claim 1, whereby the strands are continuous strands.
3. Process according to Claim 1, whereby the strands are, at least in the case of some of them, chopped strands.
- a 4. Process according to ^{claim 1} ~~one of Claims 1 to 3~~, whereby the strands are formed of reinforcing filaments, preferably glass filaments, and/or filaments made of an organic material.
- a 5. Process according to ^{claim 1} ~~one of Claims 1 to 4~~, **characterized in that** the strands are opened mechanically under the action of a cascade and/or of jets of fluid arriving transversely on the strand(s) of the first layer or series of layers on the conveyor.
- a 6. Process according to ^{claim 1} ~~one of Claims 1 to 5~~, **characterized in that** the strand or strands of the first layer or series of layers, during or after opening, pass through a bath which encourages their constituent filaments to disperse.
- 25 a 7. Process according to ^{claim 1} ~~one of Claims 1 to 6~~, **characterized in that** the strand or strands of the first layer or series of layers are opened by a fluid comprising a liquid binder.
- a 8. Process according to ^{claim 1} ~~one of Claims 1 to 7~~, **characterized in that** a binder in powder form is poured onto the superposed layers of strand(s).
- 30 9. Process according to Claim 8, **characterized in that** the strands are re-humidified just before and/or just after the powder-form binder is deposited.
- a 10. Process according to ^{claim 7} ~~one of Claims 7 to 9~~, **characterized in that** the superposed layers of strand(s) are introduced into a device for melting and/or polymerizing and/or cross-linking the binder.
- 35 11. Process according to Claim 10, **characterized in that** the superposed layers of strand(s) are dried before being

introduced into a device for melting and/or polymerizing and/or cross-linking the binder.

a 12. Process according to ~~one of Claims 1 to 11,~~ ^{claim 1}
characterized in that the strand or strands of the first layer or
5 series of layers are opened on a first conveyor then introduced
onto a second conveyor on which they are covered with the
strand(s) of the second layer or series of layers.

a 13. Process according to ~~one of Claims 1 to 12,~~ ^{claim 1}
characterized in that the strand or strands of the first layer or
10 series of layers are turned before being introduced onto the
second conveyor.

a 14. Process according to ~~one of Claims 1 to 13,~~ ^{claim 1}
characterized in that each layer of strand(s) comes from a
bushing and/or an extruder and/or from (a) winding(s).

15 15. Device for implementing the process, this device
comprising:

- a first device or series of devices for supplying a first layer
or series of layers of strand(s) formed of filaments,
- a second device or series of devices for supplying a
20 second layer or series of layers of strand(s) formed of filaments,
- at least one conveyor intended to receive the first layer or
series of layers and the second layer or series of layers,
- and at least one device for opening strands which is
located downstream of the first supplying device or series of
25 supplying devices and upstream of the point of the conveyor at
which the first layer or series of layers and the second layer or
series of layers are superposed.

30 16. Device according to Claim 15, **characterized in that**
the device for opening the strands has an opening at its top
allowing the continuous escape of a fluid supplied continuously to
the device, this fluid flowing along a vertical wall at the base of
the opening device.

35 17. Mat comprising one or more layer (layers) of integrated
strand(s) and one or more layer (layers) of strand(s) at least
partly opened in the form of filaments and capable of being
obtained according to the process of ~~one of Claims 1 to 14,~~ ^{claim 1}

18. Mat comprising one or more layer (layers) of integrated
strand(s) and one or more layer (layers) of strand(s) at least
partly opened in the form of filaments, the latter layer or layers

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having a filament dispersion gradient.

19. Mat according to Claim 18, whereby the strands are formed of reinforcing filaments, preferably glass filaments, and/or filaments of an organic material.

5 *a* 20. Mat according to ~~one of Claims 18 and 19~~ ^{Claim 18}, whereby the strands are continuous strands.

21. Composite comprising at least one organic material and/or one inorganic material and comprising at least reinforcing strands, **characterized in that** it comprises at least one mat

10 *a* ~~according to one of Claims 17 to 20~~ ^{Claim 17}

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